

**Warranty**

Each CruzPro product is carefully tested and calibrated at the factory before shipping and is warranted for one full year against original defects in materials or workmanship. This warranty does not include damage to the product resulting from accident or misuse.

If the product should become defective within the warranty period, we will repair or replace it free of charge, including free return transportation, provided it is delivered prepaid to the dealer from whom it is originally purchased.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state, or country to country.

**CruzPro<sup>®</sup>  
CS60**



**Clock With  
Four Timed 12 VDC Switches**

**Notes**

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**Introduction**

The CS60 is an accurate digital clock with four electronic 12 VDC switches that can each be programmed to switch ON and OFF up to three times per day or programmed to continually switch ON and OFF periodically with different ON and OFF time periods. The front panel keys can also be used to manually switch each of the four circuits and/or enable and disable the programming for all switches simultaneously.

Each of the four circuits is capable of switching up to 4 amps for a total of 16 amps. You can use the CS60 to switch lights, radios, weather fax machines, small electric motors, live bait tank aerators, etc.

Five levels of backlighting can be selected for nighttime viewing and all setup constants are saved in a nonvolatile memory.

## Table of Contents

Introduction .....	3
Specifications .....	4
Installation .....	5
Mounting and Wiring .....	6
Operation .....	8
Key Functions .....	8
Backlight Intensity .....	8
Setting the Time-Of-Day Clock .....	9
Switching Circuits ON/OFF Manually .....	9
Programming Automatic and Periodic ON/OFF Times ..	10
Activating/Deactivating Automatic Mode .....	13
Clearing Circuit Programming .....	13
Clearing all Circuit Programs Simultaneously ..	14
Calibrating the Clock .....	14
Selecting Quiet or Beep Mode .....	15
Helpful Hints and Warnings .....	16
Other CruzPro Products .....	19

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CS60MAN-A

<http://www.cruzpro.com> Made in New Zealand

## Other CruzPro Products

- DC Volts/Amps/Amp-Hour Monitors
- AC Volts/Amps/Frequency/kW Monitor
- LPG/Petrol Gas Detectors/Alarms
- Bilge Water Alarms & Bilge Pump Controllers
- Windlass Controller/Chain Counters
- Digital Fuel Gauge & Fuel Consumption Calculator
- Smart Alternator Regulators
- Marine Security System
- RPM/Engine Hours/Elapsed Time Gauges
- Digital Oil Pressure Gauge/Alarm
- Digital Water Temperature Gauge/Alarm
- One and Three Bank Digital Volts Gauges
- Digital Amps Gauge
- Engine/Exhaust Temp. Monitor & Digital Pyrometer
- Digital Clock/Watch/Race Timers/Alarms
- 8 and 16 Amp Light Dimmers / Motor Speed Controller
- Solar Panel Charge Controllers
- 4 & 8 Channel NMEA Combiners & Repeaters
- Multifunction Instruments
- PC Based Color Fishfinders

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## Specifications

**Power supply:** 9.5 to 15.0 VDC, .020 amps min.,  
16 amps maximum.

**Operating temperature:** 32<sup>o</sup> to 122<sup>o</sup> F (0<sup>o</sup> to 50<sup>o</sup> C)

**Size:** 2.5" dia X 4.1" deep (61mm x 104 mm)

**Accuracy:** Factory calibrated to better than 3 seconds  
per day. User settable calibration to 1 second per day.

**Switching:** Four solid state switches. 4 amps maximum  
current per switch 12 VDC. Up to 3 ON/OFF cycles  
per circuit per day. Unlimited periodic ON/OFF cycles  
per circuit per day (i.e. ON for 2 minutes, OFF for 10  
minutes, ON for 2 minutes, OFF for 10 minutes, etc.).

**Display:** 4 digits. 24 hour format. Liquid Crystal Dis-  
play. Five levels of backlighting.

Page 4

of two or more outputs together (i.e. use 3 ON/OFF  
times from circuit #1 and 1 to 3 more from circuit #2).

- All times are displayed in 24 hour format.
- When you program a "Periodic" ON/OFF time the  
circuit will switch on for the ON time at the next change  
of the minute (within 60 seconds) if Automatic Mode is  
activated.
- Use wire to power the CS60 that is heavy enough to  
carry the total current of all four circuits without drop-  
ping the voltage below 9.5VDC.
- 600 watt transient rejection diodes are installed on  
the CS60 power supply line and on each of the four  
output circuits. Additional external protection may be  
required if you are switching inductive loads (motors,  
solenoids, high current relays, etc.).

Page 17

## Helpful Hints and Warnings

- Automatic programming is automatically deactivated if power is turned off and back on.
- Circuits will not turn ON under automatic programming until automatic mode is activated (Page 13).
- Programming an ON or OFF time of 00:00 disables that circuit and time-slot (i.e. you cannot turn a circuit ON or OFF at 00:00 time). If you program a valid ON time and a 00:00 OFF time, then the circuit will switch ON at the programmed time and stay ON. If you program a 00:00 ON time and a valid OFF time the circuit will only switch ON when activated manually and switch OFF at the programmed OFF time.
- You can program more than 3 individual ON/OFF time combinations for a circuit by paralleling the outputs

Page 16

## Installation

*Before starting the installation, please read this entire section first. Be sure to install the bulkhead gasket before you install the instrument. Finger tighten the screws that mount the instrument bracket - do not use tools.*

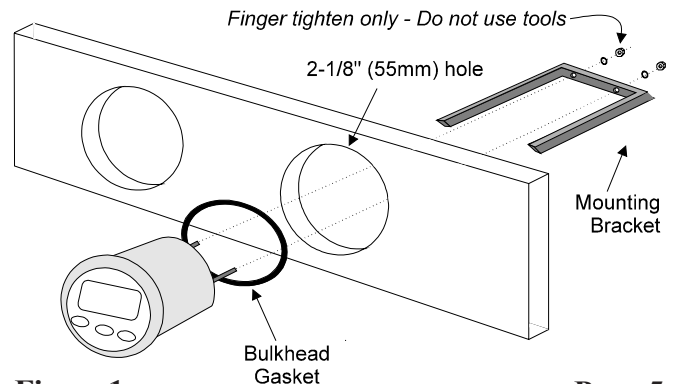


Figure 1

Page 5

## Clearing all Circuit Programs Simultaneously

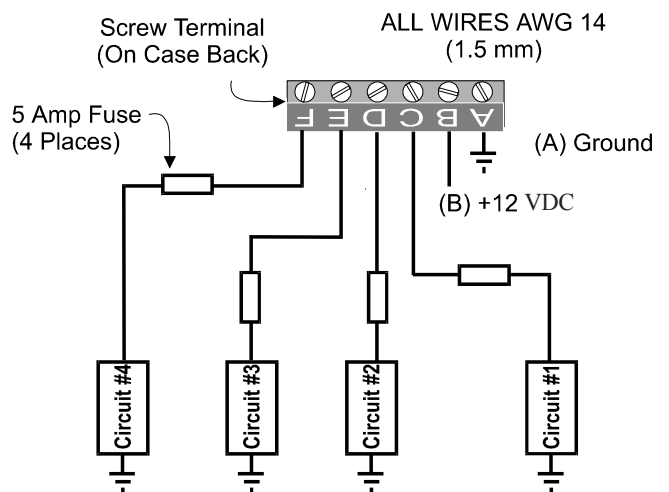
While viewing Time-Of-Day, press and hold both the ▼ and ▲ keys for ten seconds (until you hear a long beep and "cLr" is displayed). All programmed ON/OFF times for all circuits and all time slots will be reset to 00:00, all circuits turned OFF and Automatic mode is deactivated.

## Calibrating the Clock

Turn OFF the power and reapply power while holding down the ▼ and ▲ keys. The number "0" is displayed. Use the ▼ and ▲ keys to select how many seconds (-30 to +30) per 24 hours to increase or decrease the clock speed (i.e. add 5 seconds per 24 hours if the clock is 5 seconds per 24 hour slow). Press the + key for 1/2 second to save the new clock calibration.

Page 14

Figure 2



Page 7

## Mounting and Wiring

- Drill a 2-1/8" (55mm) hole where you want to mount the instrument (Fig. 1).
- Bring the power, ground and circuit lines out of the mounting hole and use a small flat screwdriver to make the connections to the screw terminals on the instrument case back as shown in figure 2. ***Use 5 amp fuses on all four circuit lines as shown in Fig 2.***
- Carefully check all your wiring against those shown in figure 2. If everything is wired correctly you can mount the CS60 in the instrument hole. Be sure the bulkhead gasket is in place and use only finger tension to tighten the bracket hold-down nuts. *Do not overtighten the bracket or you may damage the case - do not use tools to tighten the nuts.*

Page 6

## **Operation**

### Key Functions

The ▼, + and ▲ keys are used to select backlight levels, Time-of-Day clock, calibrate the clock, program each circuit's ON/OFF times, and other functions. After changes are made, the new information is automatically saved to memory.

### Backlight Intensity

Press the + key for 1/2 second to adjust the backlight level for nighttime viewing. Each time you press the + key the backlight level will change: 1, 2, 3, 4, OFF, 1, 2, ... etc.

Page 8

## Selecting Quiet or Beep Mode

You can program the CS60 to beep when a circuit is automatically switched ON or OFF or to remain quiet (factory default). When Beep mode is selected the CS60 will sound the internal buzzer for one second when any circuit is automatically switched ON or OFF.

To select Beep mode, press both the + and ▲ keys for 1/2 second. The word "bEEp" will be displayed briefly.

To select Quiet mode, press both the ▼ and + keys for 1/2 second. The word "nonE" will be displayed briefly.

Page 15

## Activating/Deactivating Automatic Mode

While viewing the Time-Of-Day clock, press the ▲ key for 1/2 second to activate automatic programming. The colon blinks on the Time-Of-Day clock when automatic programming is active. To deactivate automatic programming, press the ▼ key for 1/2 second. All circuits will be turned OFF.

## Clearing Circuit Programming

To clear a circuit's programmed ON/OFF times, quick press the + key until the display shows the circuit to clear (1, 2, 3, or 4). Press and hold both the ▼ and ▲ keys for ten seconds (until you hear a long beep and "cLr" is displayed). All ON/OFF time slots for that circuit will be cleared to 00:00 and the display will switch back to the Time-Of-Day Clock.

Page 13

To program a circuit to turn ON and OFF periodically, save your entry by pressing both the ▼ and ▲ keys for 1/2 second instead of pressing the + key for 1/2 second.

Periodic programming is only allowed for time slot #1. Attempts to program time slots 2 or 3 as a periodic program are ignored and will be saved as normal ON/OFF programming. If a circuit's time slot #1 is programmed to turn ON and OFF periodically, any normal ON/OFF programming for time slots 2 and 3 are immediately deleted.

To change a periodic program back to a normal ON/OFF program just save the OFF time using the + key instead of the ▼ and ▲ keys.

### Setting the Time-Of-Day Clock

While viewing Time-Of-Day press and hold the + key for ten (10) seconds. You will hear a long beep. Press the + key to switch between hour or minute selection. Use the ▼ and ▲ keys to change the hours or minutes. Press the + key for 1/2 second to save your entry.

### Switching Circuits ON/OFF Manually

Quick press the + key to cycle between viewing the clock and "Cir1", "Cir2", "Cir3" and "Cir4" (Circuits 1-4). While viewing the circuit you wish to switch, press the ▲ key for 1/2 second to switch that circuit ON or press the ▼ key for 1/2 second to turn that circuit OFF.

### Programming Automatic and Periodic ON/OFF Times

Each of the four circuits can be programmed to turn ON and OFF up to three times per day or periodically with different ON and OFF time periods (i.e. repeatedly switch a circuit ON for 10 minutes, OFF for 20 minutes, ON for 10 minutes, OFF for 20 minutes, etc.).

To select the desired circuit and time slot to program, press the ▼ or ▲ key for 3 seconds (till the long beep) while viewing the Time-Of-Day clock. If you pressed the ▲ key, Circuit #1, first time-slot #1 ("On1.1") will be displayed. If you pressed the ▼ key, Circuit #4, last time-slot #3 ("On4.3") will be displayed.

With each subsequent quick press of the ▲ or ▼ key a new time slot is displayed. Quick pressing the ▲ key

cycles you UP through all the possible circuits and time slots. Quick pressing the ▼ key cycles you DOWN through all the possible circuits and time slots.

When no key is pressed for 3 seconds the "ON" time for that circuit is displayed. Quick press the + key to select between setting hours or minutes. Use the ▲ and ▼ keys to change the hours or minutes to the desired ON time value. Press the + key for 1/2 second to save your ON time entry.

Now the word "OFF" is shown briefly and the OFF time for that circuit will be displayed. Use the same procedure to set the OFF time and press the + key for 1/2 second to save your entry and return to the Time-Of-Day display mode.